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tion of a councilor for two consecutive terms shall not apply to the councilors elected by the Council itself.

Sec. 4. In case of a vacancy in any office, except that of president, the Executive board may designate some person to discharge the duties of the same *pro tempore.*

Sec. 5. The president and secretary, with one other member appointed by the Executive board, shall constitute a program committee, which shall, under the supervision of the Executive board, arrange the program for each annual meeting, and designate persons to prepare papers, open discussions, etc., and shall decide whether any paper which may be offered shall be accepted or rejected, and if accepted, whether it shall be read entire, by abstract or by title. It shall recommend to the Executive board printing accepted papers entire or to such extent as may be considered desirable. Abstracts of papers to be presented at annual conferences shall be in the hands of the program committee at least two weeks before the conference.

Sec. 6. The Executive board shall appoint a committee of eight on library training, which shall from time to time investigate the whole subject of library schools and courses of study, and report the results of its investigations, with its recommendations. The membership of this committee shall be as follows: one member of a state library commission, one librarian of a free public library of at least 50,000 volumes, one librarian of a college or reference library, one library trustee, four library school graduates including one from the faculty of a library school; one school graduate and one other member to retire each year.

Sec. 7. The Executive board shall appoint annually a committee of three on library administration, to consider and report improvements in any department of library economy, and make recommendations looking to harmony, uniformity, and co-operation, with a view to economical administration.

Sec. 8. The Executive board shall at each annual meeting of the Association appoint a committee of three on resolutions, which shall prepare and report to the Association suitable resolutions of acknowledgment and thanks. To this committee shall be referred all such resolutions offered in meetings of the Association.

Sec. 9. The objects of sections which may be established by the Council under the provisions of Sec. 17 of the constitution, shall be discussion, comparison of views, etc., upon subjects of interest to the members. No authority is granted any section to incur expense on account of the Association or to commit the Association by any declaration of policy. A member of the Association eligible under the rules of the section may become a member thereof by registering his or her name with the secretary of the section.

Sec. 10. Provision shall be made by the Executive board for sessions of the various sections at annual meetings of the Association, and the programs for the same shall be prepared by the officers of sections in consultation with the program committee. Sessions of sections shall be open to any member of the Association, but no person may vote in any section unless registered as a member of the same. The registered members of each section shall, at the final session of each annual meeting, choose a chairman and secretary, to serve until the close of the next annual meeting.

THE PRESIDENT: There is no further business, ladies and gentlemen, therefore the meeting is adjourned until tomorrow at half-past two, punctually.

FIFTH GENERAL SESSION

(Saturday, July 3, 1909, 2:30 p. m.)

THE PRESIDENT called the meeting to order, and MR CEDRIC CHIVERS read his paper on

THE PAPER AND BINDING OF LENDING LIBRARY BOOKS

Practical experience has told us of the deterioration of paper used in lending library books in recent years. Books are used harder now than they ever were, and the paper composing them is of a worse quality. Every effort has been made to bind modern books in an effective fashion for public use, but complete success has not been attained with too large a number. The utmost care exercised in method, workmanship, and materials is not always successful. There has been something elusive and unreliable about the paper of books which has defied the best efforts of the bookbinder. What percentage of books have ineffective binding owing to the treacherous qualities of their papers there is no means of determining, but it is evident that many books after careful binding do not serve well.

It is clear that the bookbinder has not understood the first thing which should be ascertained before binding a book, that is, the material which he undertook to bind. He has followed the traditions of a craft some four hundred years old, and, other things being equal, if the material with which he had to deal had been of the same quality, the same satisfactory results should have been obtained. But the paper he has had to bind has been of a very different sort, and he has failed to re-adapt his methods to the varying qualities of the paper which the modern publishing world has been using. The craft, adapted to and dealing with a material so strong as to withstand strains of thirty, forty, or fifty pounds to the inch, finds itself nonplussed and futile in dealing with a material able to withstand only strains of four, three, two, and one pound to the inch.

Doubtless in olden times paper varied in quality, but the worst paper which was used for books likely to be purchased by public libraries before so recent a year as 1890, was of a quality sufficiently good when folded and sewed to have held together for a reasonable service with the ordinary and traditional methods of bookbinding. It has been impossible to tell from the appearance and handling of very much of the paper used more recently what qualities it possesses which make it unreliable in a bound form.

It has become tiresome to the librarian and exasperating to the bookbinder to discover after a book has been bound with every possible care that it has been wrongly bound and should have been dealt with in another fashion. Explanations appear as excuses, and annoyance to all concerned is the certain result. This state of affairs is one which cannot be allowed to continue, and it has become necessary, late in the day, to understand when binding a book something more than has hitherto been known of the thing to be bound.

One of the first things which would naturally occur to one is to discover the composition of the paper which in the past gave us proper results. To that end I collected from librarians a number of books which had given satisfactory service, and pages from them were sent to a paper technologist for analysis and report. I have before me a list of 20 books, published by 11 different publishers, with the number of times they were loaned to readers indicated. The number of issues of each of these books is here shown:

Reference no. of book	No. of issues	Thickness of paper (1000ths of an inch)	Strength of paper in lbs.		Fibrous composition				
			Machine direction	Cross direction	Chemical wood	Esparto	Rag	Mechanical wood	Other
33	134	4.3	11.6	8.0	50	38	5	7	..
39	140	6.6	18.0	11.0	50	50	..	..	..
32	152	4.2	17.8	6.0	100	..	..	..	..
43	181	4.2	15.7	7.5	60	34	5	1	..
34	214	5.9	34.3	15.5	45	53	2	..	..
41	259	5.2	18.2	9.2	50	45	5	..	..
42	274	4.6	14.2	7.6	1	98	1	..	..
29	282	4.5	12.5	9.5	..	100	..	..	..
31	290	3.5	13.0	6.6	60	35	2	..	3
36	300	4.0	14.3	7.3	25	70	..	5	..
40	334	5.2	23.2	12.0	15	85	..	..	..
70	483	3.5	12.66	6.0	60	30	10	..	..
71	575	5.75	14.0	8.0	40	58	..	2	..

These figures do not show the relative values of the paper for binding. For the purpose of the lending library they may all be taken as of nearly equal worth.

The withdrawal of the books from service depended upon the librarian's notion of cleanliness and his idea of what makes a decent book for public service. It would be reasonable to assume that these books could be loaned on an average 200 times.

These selections, then, were made not to support any theory of bookbinding, nor as worthy instances of library economy, but because they prove the paper to have been good for its purpose. As to the thickness of the different papers, there was little variation, 3.8/1000″ being the thinnest and 6.6/1000″ being the thickest. This in comparison with a list of 1,000 books compiled this year in which the variation is from 1/1000″ to 13/1000″. Their strength, also, did not vary nearly so much as that of recent papers, the strongest of them breaking at a strain of 15 pounds and the weakest breaking at a strain of 6 pounds; while the variation between recent books has been as between 40 pounds and 1 pound. My purpose was, however, to discover the fibrous composition of these papers, and here some very surprising results were shown.

The chief constituents of modern paper are chemical wood, esparto grass, and sometimes a slight intermixture of rag. There are other materials but they, when not actually deleterious, at any rate do not tend to strengthen the paper. I think it is generally understood that esparto grass alone would not make a strong paper, that it is used in conjunction with the chemical wood to soften the paper and make it a better printing subject. However that may be, we have the following results of our analyses: One book showing an issue of 280 times had a fibrous composition 100% esparto. Another came to pieces after being loaned only once. It had a fibrous composition of 2% chemical wood and 98% esparto. A book, issued 398 times had 5% chemical wood, 80% esparto and 15% other mixtures. One issued 152 times was composed of 100% chemical wood. Another book issued 140 times was composed of 50% chemical wood and 50% esparto. Yet another issued 259 times had 50% chemical wood, 45% esparto and 5% rag. Still another issued 483 times had 60% chemical wood, 30% esparto and 10% rag. One issued 573 times had 40% chemical wood, 58% esparto and 2% mechanical wood.

What are we to say to such results as these? The composition or finish of the paper appears to have but little to do with its value for the class of book under discussion. It was evident that help for the bookbinders' troubles could not be discovered in this way.

It should be said that nearly all these books were bound in one manner, and that in the manner in which many hundreds of thousands of books have been bound for public libraries, the books always keeping intact until the paper has given way. The binding of the book issued 483 times is just as good, except as to cleanness and the condition of its cloth sides, as the binding of the book discarded when worn out after an issue of 140 times.

Before leaving this part of the subject, I have to note an interesting and curious fact in regard to a series of popular books much and worthily in demand, but which give us—librarians and bookbinders alike—considerable trouble. In analyzing the paper of these books we discovered that one book was composed of chemical wood 10% and esparto 90%, while another book of the same series but a different title was composed of 90% chemical wood, 8% esparto and 2% rag. And although the composition of these papers was reversed, we found the number of issues to be very nearly alike, with the advantage, however, on the side of the paper composed of 10% chemical wood and 90% esparto. From what we know of the value of fibre we should have thought the second book showing 90% chemical wood, only 8% esparto, with 2% rag, would be much superior, whereas it was rather inferior. It is clear, then, that something happens to paper, apart from its fibrous composition, which seriously affects it from the librarian's and bookbinder's point of view.

I ought to say that many things happen to paper which harmfully affect it for our use, such as printing on it and folding it too soon after manufacture; the manner of bleaching it, etc. But to pursue this inquiry is not germane to our subject. It is a matter beyond our control and effective influence.

The most injurious treatment in recent years to which paper has been subjected is that of overstirring and beating its pulp, and so impregnating it with air as to form the feather-weight papers which are among the worst with which we have to deal. This does not affect, however, the instances mentioned above. There is little possibility of making a good and lasting book with some of the papers made from this soufflé of pulp. Beating or whisking a paper pulp in this fashion fully explains why the fibrous composition has even less to do now than formerly with the mechanical value of paper. The following illustrations, figures 1 to 8, make clear these features of our subject:

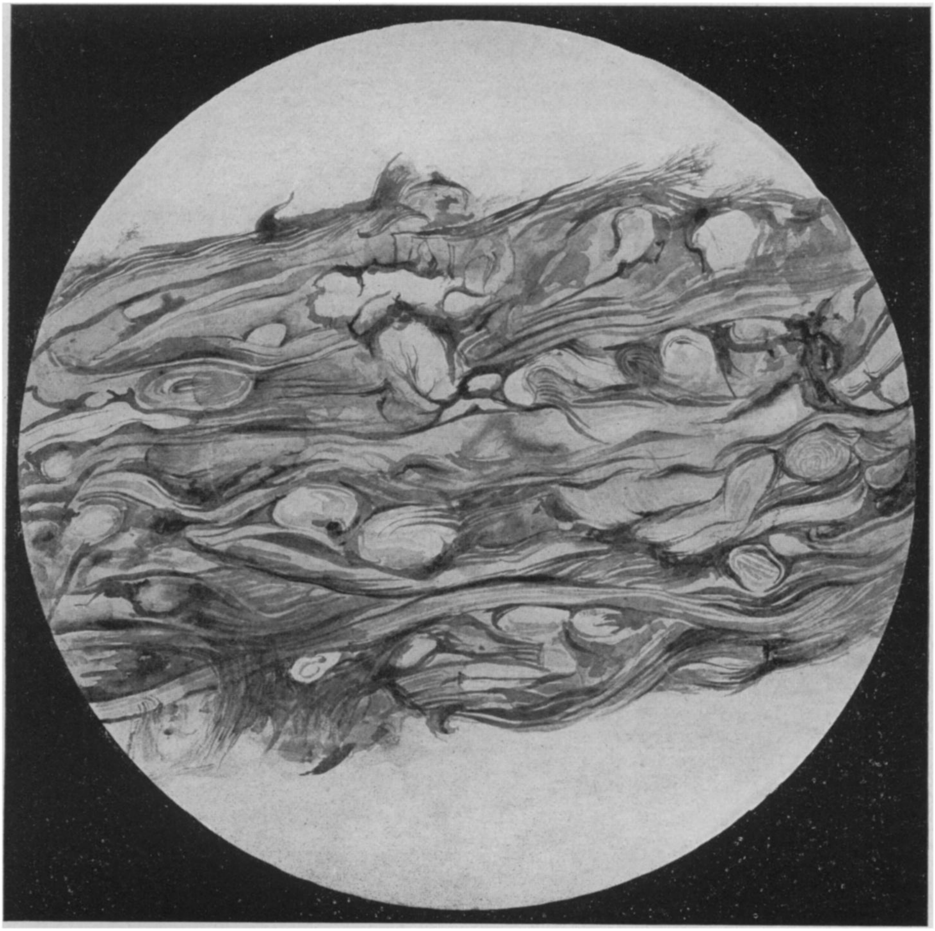


Figure 1

Figure 1 is a photomicrograph of the edge of a piece of paper made entirely of linen rag. It has been loaned to me by Mr R. W. Sindall, author of "An elementary manual of paper technology." This paper is of too costly a quality, indeed it is undesirable for many reasons, for use in such books as those under discussion; but it illustrates the desirable qualities of warp and woof, or inter and across penetration of the fibrous composition of paper, which make for strength. This is hand-made. It is not possible to get such effects with machine-made paper.

Other papers here shown are machine-made and of varied values.

FIGURE 2

2a	2b
Transverse section	Surface section
Fibres close, air space small	Fibres close, well pressed

General description: A close, heavy, moderately calendered paper.

Thickness	6·5/1000″
Fibrous composition:	
Chemical wood	5%
Esparto	95%
Breaking weight, machine way of paper	40.25 lb.
Breaking weight, cross direction	19.75 lb.
After folding, machine direction	24.5 lb.
Since this book showed the fibrous direction to be in the lengthway of the book, its strength after folding and piercing by needle was taken and shown to be	10.00 lb.

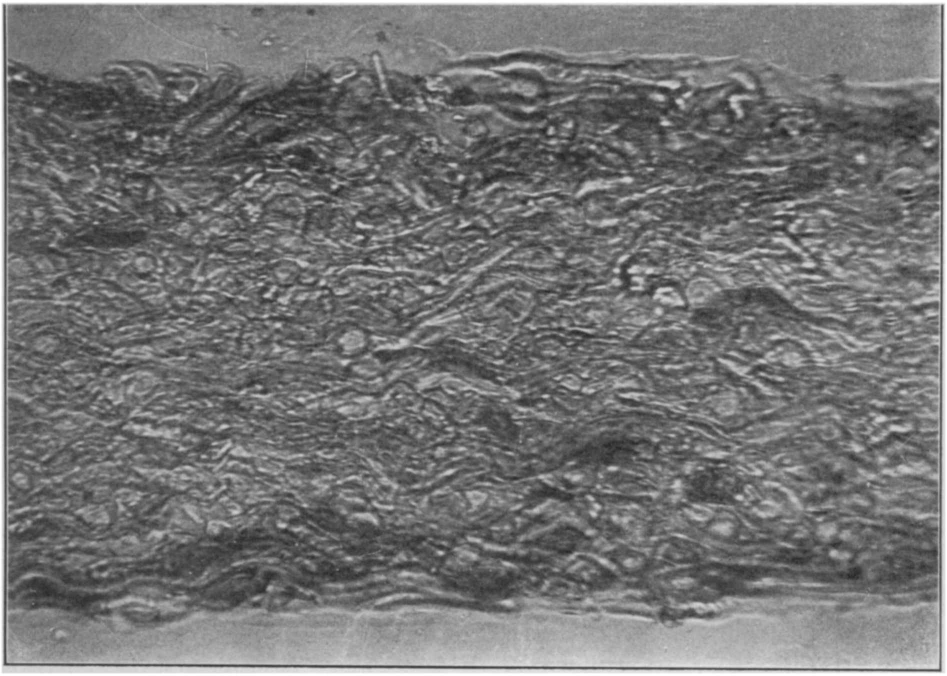


Figure 2a

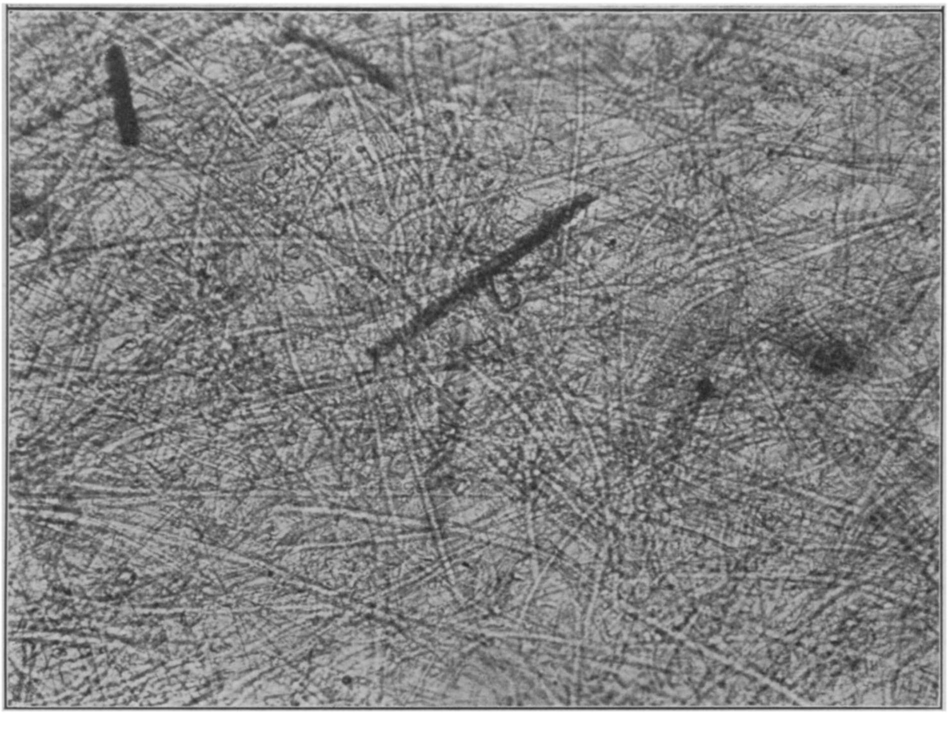


Figure 2b

FIGURE 3

3a	3b
Transverse section	Surface section
Air space very large	Fibres open and not pressed down

General description: A thick, bulky, feather-weight antique.

Thickness	8⁄1000″
Fibrous composition:	
Chemical wood	50%
Esparto	50%
Breaking weight, machine way of paper	18.3 lb.
Breaking weight, cross direction	10.3 lb.
After folding and needle piercing	9.75 lb.
This is shown the strong way of the paper since its grain was across the pages of the book.	
Breaking weight across the grain	7.5 lb.

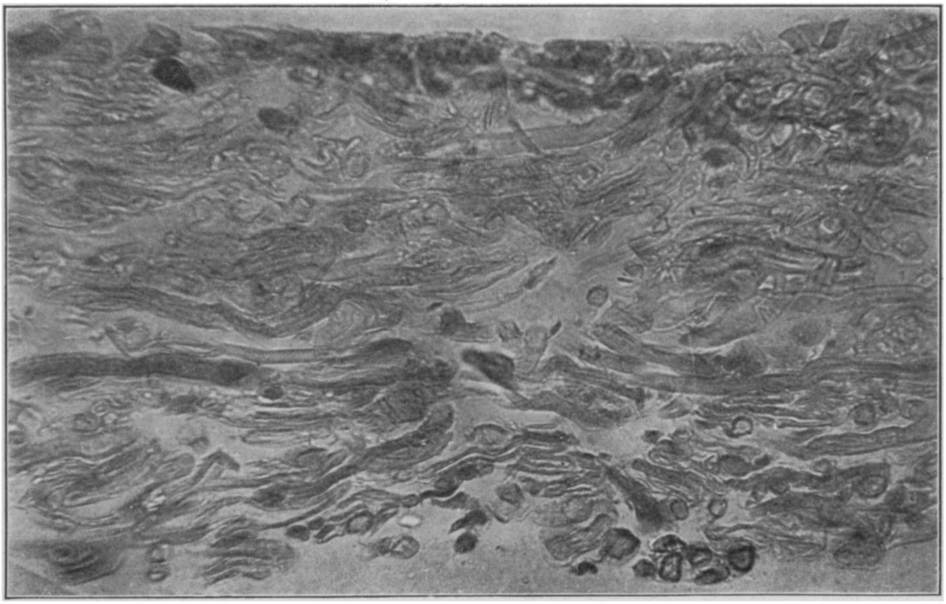


Figure 3a

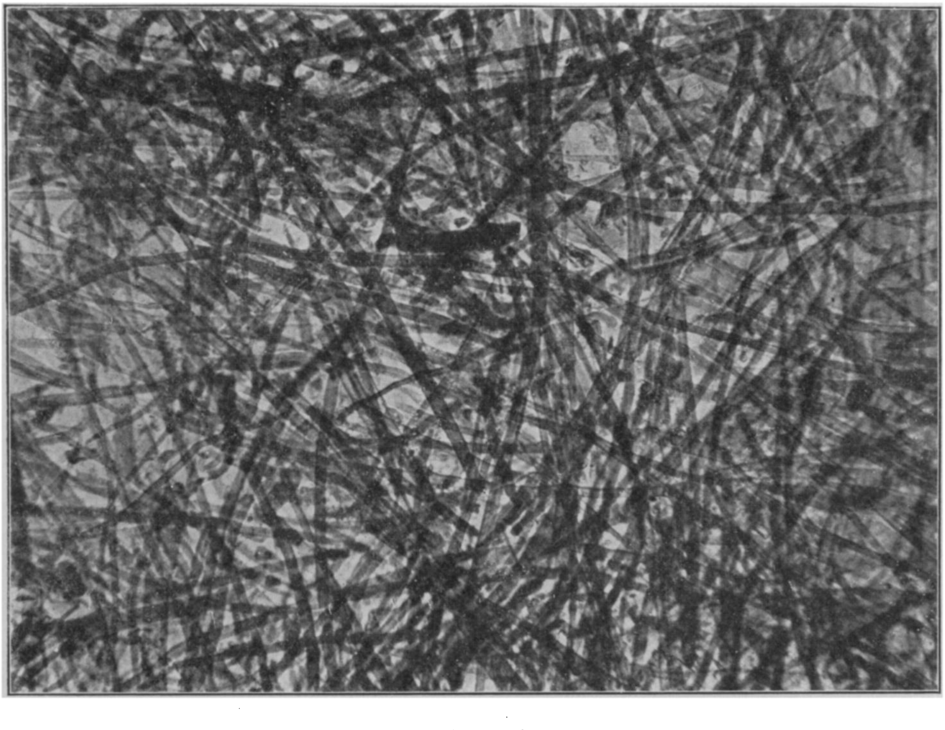


Figure 3b

FIGURE 4

4a Transverse section

4b Surface section

General description: A feather-weight antique.

Its thickness is	8/1000″
Fibrous composition:	
Chemical wood	50%
Esparto	50%
Breaking weight, machine direction	13.00 lb.
Breaking weight, cross direction	10.00 lb.
After folding its breaking weight was	6.25 lb.
In the machine way, across the fold	4.5 lb.
Since the fibrous direction is across the page, it shows, tested with needle hole	6.00 lb.

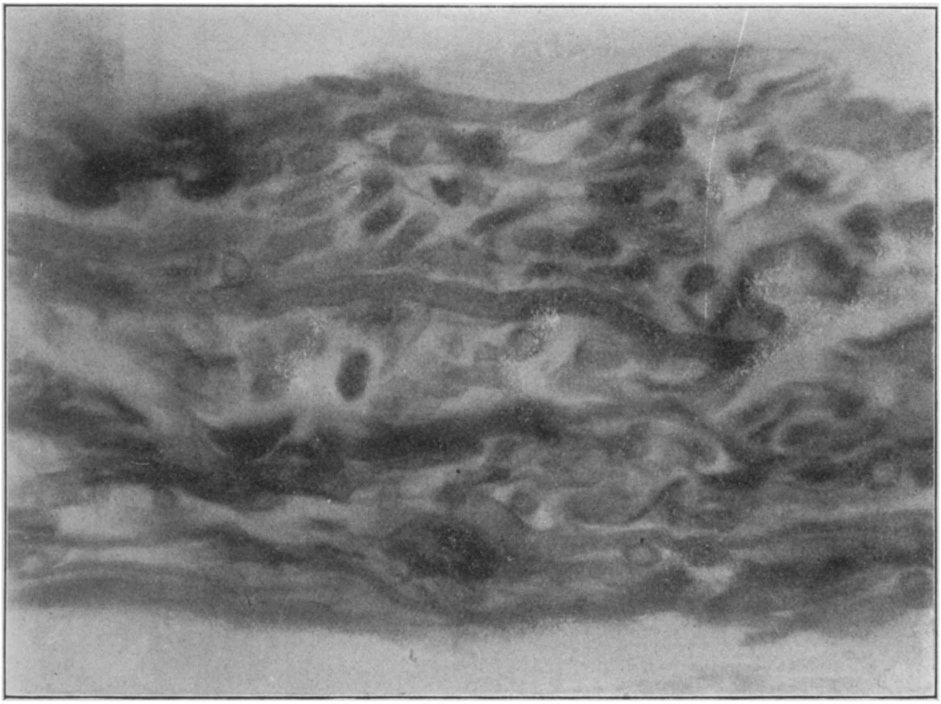


Figure 4a

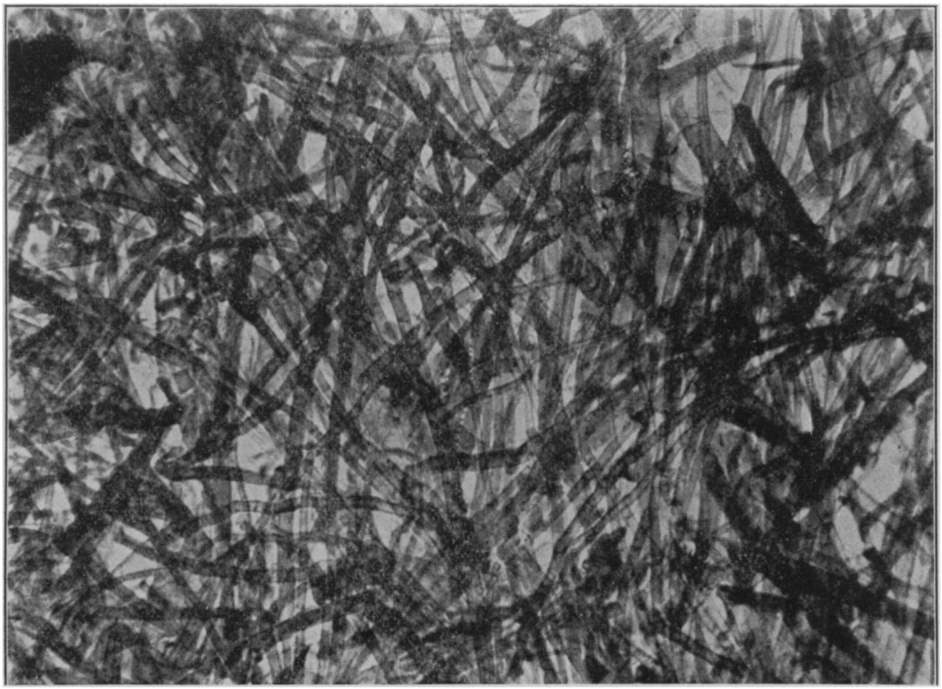


Figure 4b

FIGURE 5

5a
Transverse section

5b
Surface section

General description: A thin, esparto printing paper.

Thickness	3·75/1000″
Fibrous composition:	
Chemical wood	35%
Esparto	65%
Breaking strain, machine direction	19.75 lb.
Breaking strain, cross direction	6.00 lb.
After folding, machine direction	13.75 lb.
After folding, cross direction with needle hole	4.00 lb.

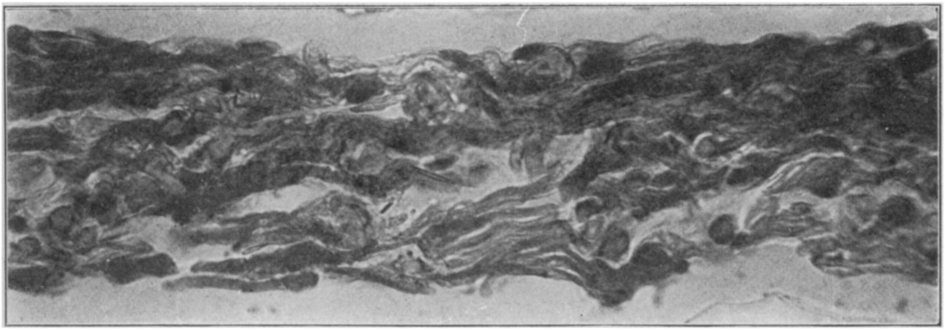


Figure 5a

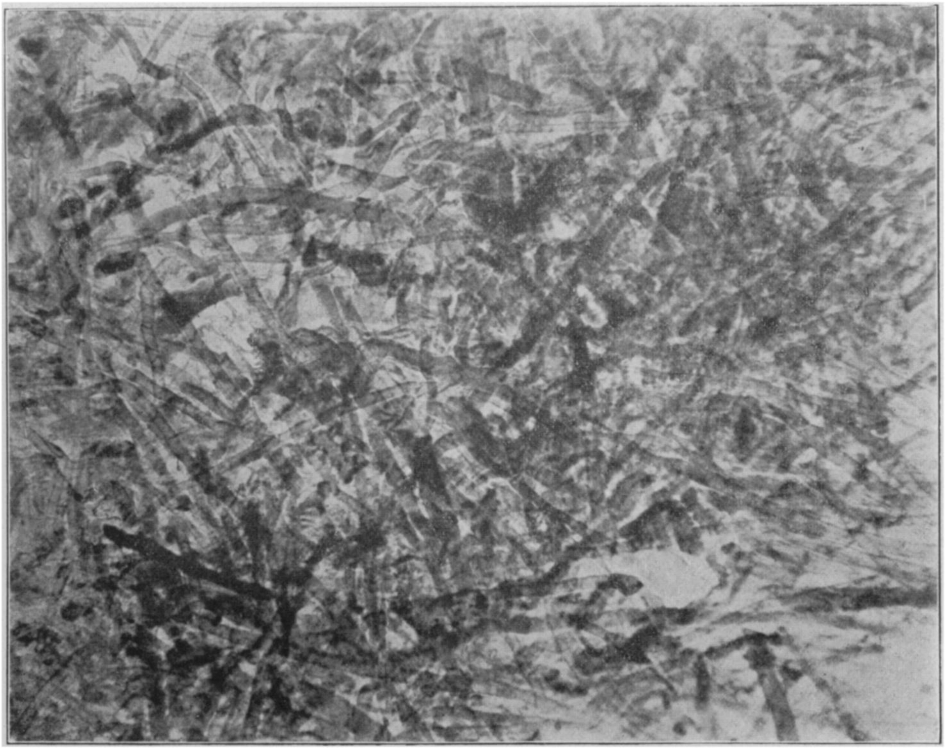


Figure 5b

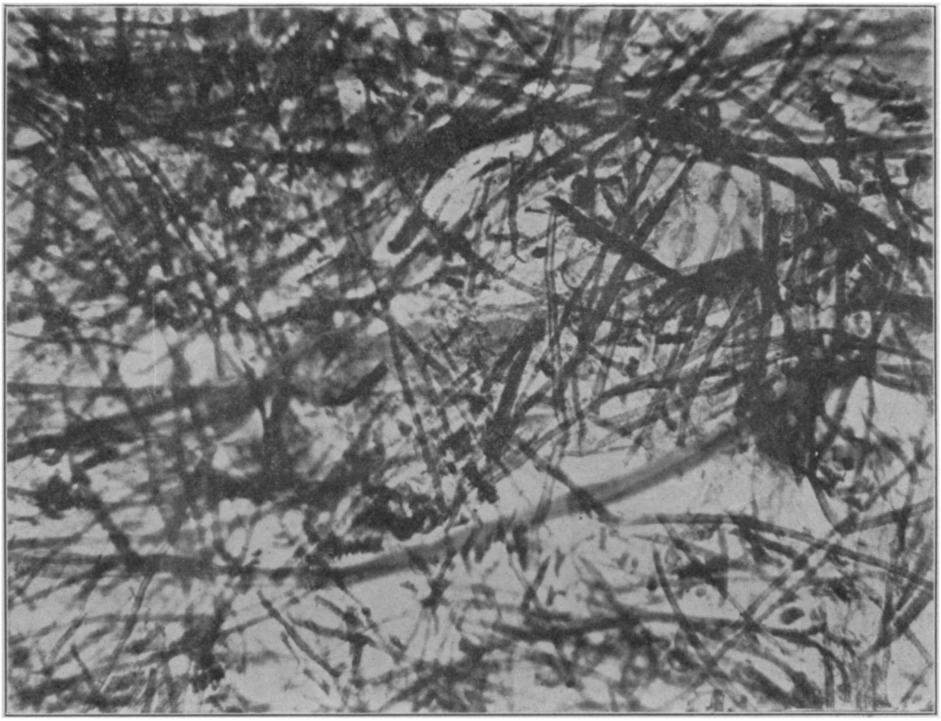


Figure 6a

FIGURE 6

6a
Surface section
Esparto characteristics very marked

6b
Transverse section
Air space very apparent

6c
Transverse section folded once only. Effect of crease in fibre very marked

Thickness of paper	7/1000″
Breaking strain, machine direction	12.5 lb.
Breaking strain, cross direction	6.5 lb.
After folding once:	
Breaking strain, machine direction	6.00 lb.
Pierced by needle, cross direction	2.75 lb.

The effect of folding on this paper, as seen in figure 6c, illustrates vividly what happens to much paper made recently. It looks as would a piece of wooden shaving folded once across the way of its grain. It is through this weakened fold that the sewing of books and their subsequent binding have had to depend for their value.

This should make apparent the necessity for revising the methods of bookbinding where a book is required to give the service of public use.

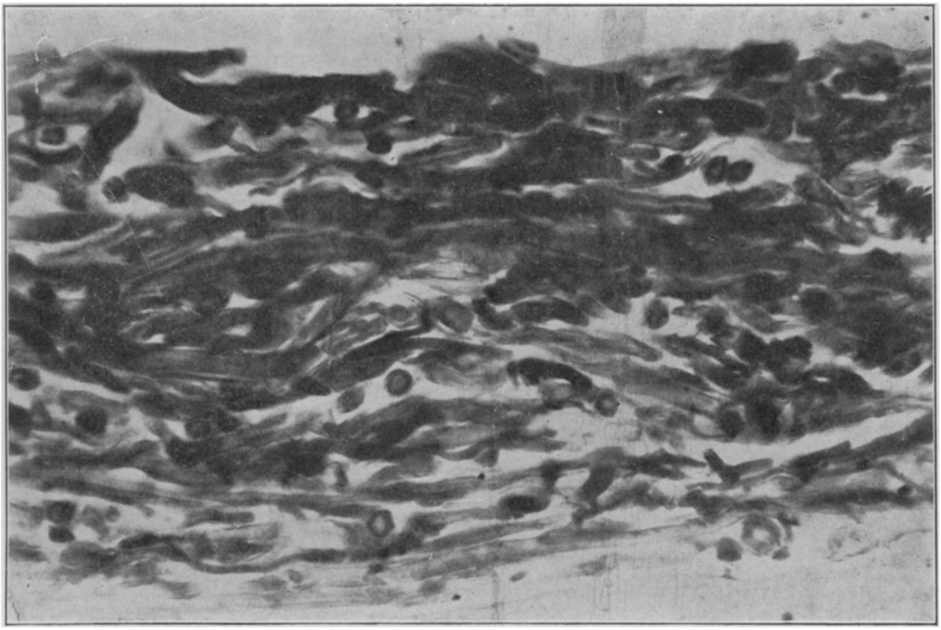


Figure 6b

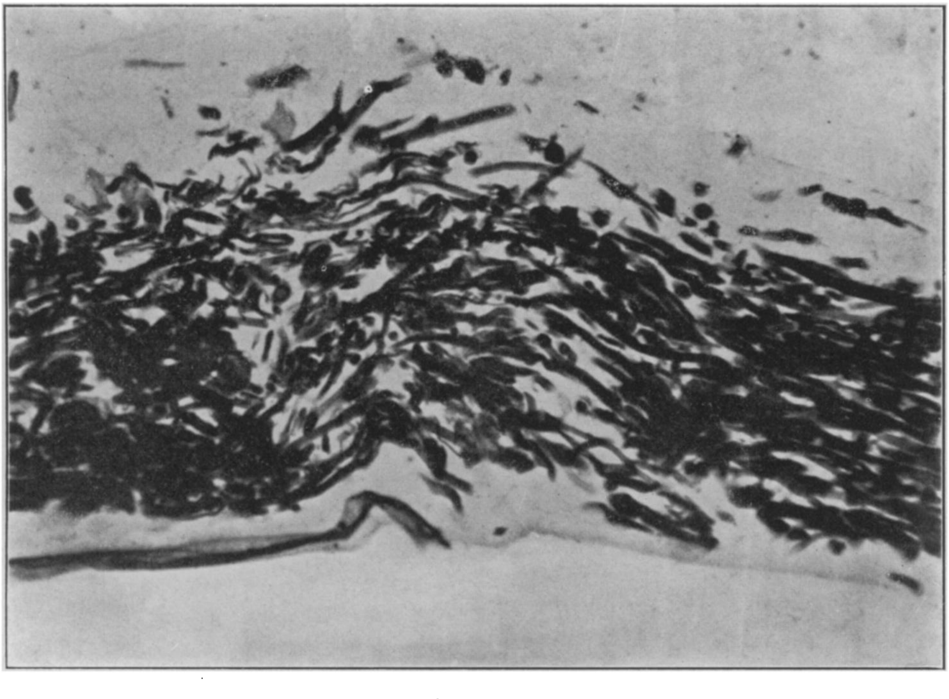


Figure 6c

FIGURE 7

Transverse section of a paper folded once, the qualities of which are as follows:

Thickness	10·5/1000″
Breaking strain, machine way of paper	38.5 lb.
Breaking strain, cross direction	20.25 lb.
After folding, machine direction	22.5 lb.
After folding, machine direction pierced by needle	18.25 lb.
After folding across the grain	13.75 lb.

FIGURE 8

Transverse section of paper after once folding.

Thickness of paper	4·75/1000″
Strength, machine way of grain	26.00 lb.
Strength, machine way across the grain	13.3 lb.
Strength after folding, machine direction	16.5 lb.
Strength, cross direction	10.00 lb.
Strength, when pierced by needle and folded in the machine direction	15.75 lb.

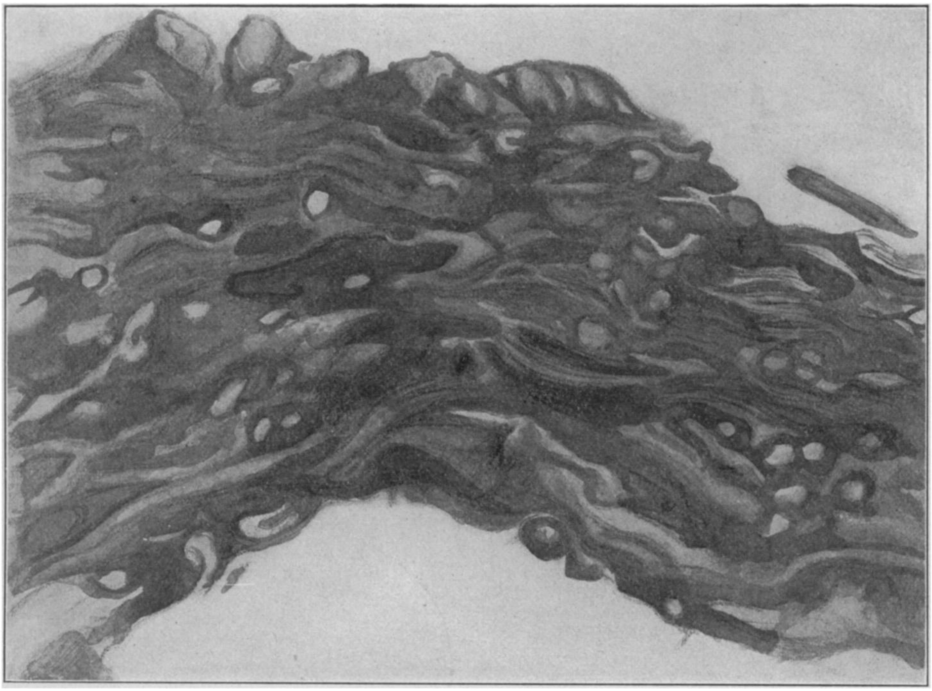


Figure 7

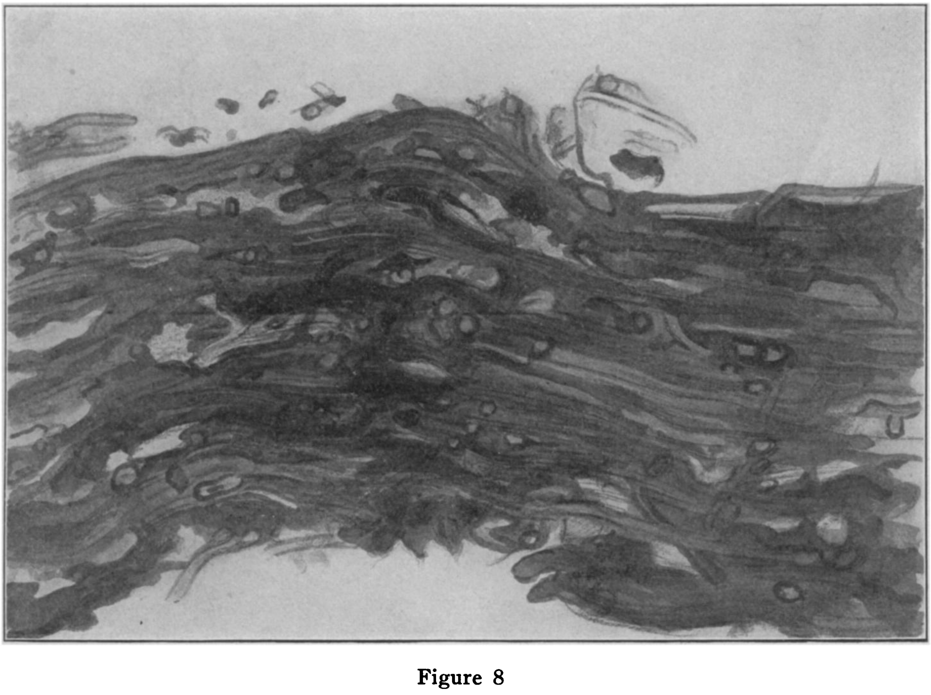


Figure 8

It should here be borne in mind that we are discussing only lending library books, which are required to serve some 150 to 200 issues during a life of from 3 to 12 years; and while the bookbinder, alive to these facts, is able to so treat these papers as to ensure economical service for the library, it is another question to determine the value and life for the reference library of books made of these papers. Here the mischief is greater and the ingenuity of the bookbinder is less effective.

To do good work and get efficient results the workman must have good tools and good materials. Now, we cannot make good books of bad paper. We can take bad paper and make the best of it. First, however, we must know how good the bad paper is, that is, we must discover what qualities of strength, pliability, and good surface the materials possess with which we have to deal.

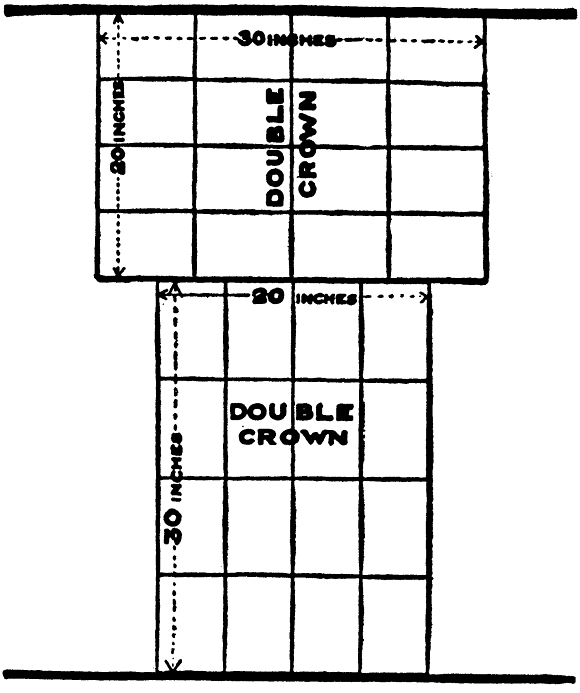


Figure 9

It is necessary to arrange the field of inquiry. To make a beginning we limit this to books used in lending libraries. An inquiry into the chemical and fibrous composition of paper does not help much, so we set this on one side.

It appears necessary, then, to learn something about the grain or fibrous direction of the paper, and its strength both in this fibrous direction and across it; the strength of the paper under its condition arranged for binding, that is, the tensile strain it will stand when folded and pierced for oversewing; its thickness; and something of its surface and stiffness. It seems reasonable to assume that the binder, having these facts before him, would be better equipped to make a well-bound book than if, ignorant of these facts, he bound a book according to a specification drawn up by someone dead and buried years before the composition of the paper to be dealt with had been thought of, or a specification by a living person who has given no more attention to the composition of modern papers than his deceased *confrère.* A large number of libraries in Great Britain require that their books be bound according to such a specification, and the custom is not unknown in this country.

It is well understood that with machine-made paper the fibre is drawn in one direction and that consequently paper is stronger when tested in one direction than in the other.

Figure 9

Figure 9 is a section of a roll of paper. The two thick lines represent the way of the paper, its fibrous direction.

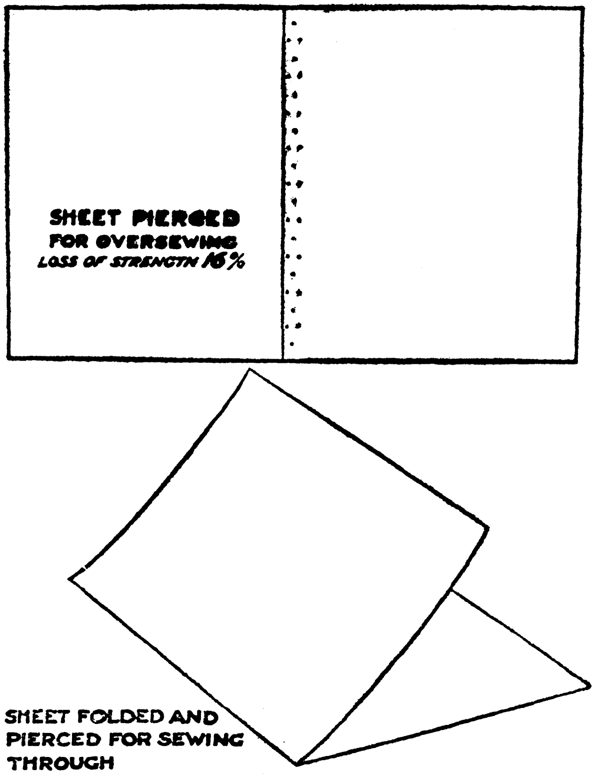


Figure 10

A sheet of paper cut as in the lower vertical form, would, when folded into 8vo., have the "grain" the same way as the type on the page, and the paper would be stronger in this direction than it would be if cut as in the upper figure with the form in the horizontal direction. In the latter, it would be arranged when folded so that the fibrous direction would be up and down the page of the book and consequently it would be weak in the fold.

As the result of testing the paper of some 5,000 books, an average difference in strength was discovered between the machine way of the paper and the cross direction of no less than 45%.

Some two years ago my advice was asked in a matter of determining the best books for wearing qualities for a large library, and many hundreds of English and American books passed under my review. It appeared to be generally considered that the paper of English fiction wore better than the paper of American fiction.

This also had been my own experience. In handling the paper in order to determine its quality, I had to decide in the "rule of thumb" fashion of handling it and in very few cases did the English book appear to be superior in quality to the American book,—that is, the substance and quality of the papers appeared equal, yet the general experience of the wearing qualities of the two papers constantly showed that the English book was the better.

In testing the 5,000 books mentioned above, the majority were English books, and the question of superiority of their papers came under review. With 3,717 English books, 66% of the papers showed the grain to be across the page, that is, in the strong way for binding; 34% of the papers exhibited the grain up and down the page, making the book weak in its fold for sewing. With 981 American books, 14% only of the papers were in the strong way of the grain, while with no less than 86% the grain of the paper was in the length of the book, and therefore the sewing was through the weakened fold of the leaf.

Figures 10 and 11

With over-sewing when properly done the paper is not weakened nearly as much; the difference showing with the sheet flat a loss only of 16% as against 48% to 52% with folding and sewing. (See figure 11.)

One other great advantage of over-sewing papers suitable for the method is that the paper is not doubled accurately and the fibre consequently is not broken as shown in figures 6-7. This will be understood on referring to figure 11.

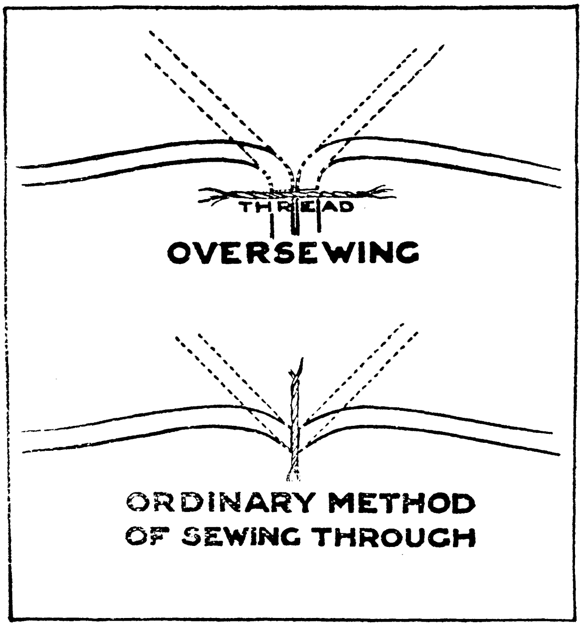


Figure 11

The difference in the strength of the paper in one direction from that in the other being as much as 45%, it is especially desirable to know of this fibrous direction in weak modern papers before proceeding to bind a book which is to be much used. A book sewed through the folded paper may serve well if the grain be across the page, but the same paper would make a weak binding if sewed in the same manner with the grain running the length of the book. The bound book

293 BOOKS

WIDTH			LENGTH				
STRAIGHT	FOLDED	PIERCED	STRAIGHT	FOLDED	PIERCED	THICKNESS	OVERSEWING TEST
397	204	188	2215	1429	1283	1500	1934

WITH 24 BOOKS one leaf from each showed the total tensile strain to be in the WIDTH or strong way of the paper:
397 lbs in the straight
204 lbs folded
188 lbs folded and pierced once
Showing a loss of 52% in folding and needle hole.

WITH 269 BOOKS one leaf from each showed the total tensile strain to be in the length-ways or weak way of the paper:
2215 lbs in the straight.
1429 lbs folded
1283 lbs folded and needle hole
Showing a loss of 42% when the leaves are folded and perforated with sewing needle.

Were these 269 books the strong way of the grain as with the above 24 books their tensile strengh would be 4367 lbs instead of 2215 lbs, the loss is therefore 50%. Showing a total loss of more than 75%

Figure 12

would, of course, experience no disadvantage if in the weak direction the paper remained sufficiently strong to hold the stitches under wear and tear, that is, if the margin of tensile strength either way of the paper were above the required tenacity.

Until recently paper was made of such consistency that it was of little importance which way of the grain the paper was folded. But library books are used and handled more frequently in these days and the more recent books are largely made ot weaker paper. It is, therefore, now, as it has not been hitherto, of importance to discover these mechanical facts and to appropriately deal with books so printed.

The strength of the paper, both with and across its grain, having been ascertained, it is desirable to know its tensile strength when folded and pierced for the sewing. Examination and testing disclose extraordinary results. Leaves folded once only and pierced with a needle as for ordinary sewing showed with modern papers an average loss in tensile strength when the grain was across the page of no less than 52%. The loss was something less, as might have been expected, when the fold was in the direction of the grain. Here the loss was 42%. But it must be remembered that a leaf of paper with the grain running the way of the fold has already been shown to have lost 45% of its strength as compared with the same paper folded in the other direction. This is an average loss. But with very many books the loss is, of course, much more.

This weakened paper largely accounts for the disastrous results so frequently discovered with recent books which have been bound with care and good materials. Even when thought is taken and the paper is examined by the ordinary method of handling it, its essential weakness above described escapes notice. It is a fact not hitherto observed that modern papers lose a very large proportion of their tensile strength in the acts of folding and sewing.

Figure 12

With 293 books most recently published at the time of writing and obtained for the purpose of a catalog in compilation, the following data as on figure 12 were obtained:

Thickness, 1500; over-sewing, 1934, mean that the total thickness of the 293 leaves was 1½″, averaging about 5/1000″ thick, and that the gross strain the paper stood after being pierced for over-sewing was 1934 pounds or an average of about 7 pounds.

To obtain good results, however, the number of leaves to the section must be carefully regulated according to the thickness and stiffness of the paper.

We come, then, to the conclusion that when a book is made of paper the fibrous direction of whose quality is down the page, and it is folded and pierced for sewing, a loss of tensile strength ensues of not less than 75%. We have already seen that with 86% of American fiction the grain is in this weak direction. The general deterioration of the paper used for fiction during the last 20 years appears, from a number of tests made for this article, to be from 10 pounds to 6 pounds in tensile strength.

The more modern papers develop the added vice of losing more of their strength in the acts of folding and sewing in the following proportions: Books printed before 1890, showing an average tensile strength of 10 pounds, lost 20% by folding and sewing; books printed during the present and last year, showing an average strength of 6 pounds, lost 50%.

This, however, does not tell the whole story for we have now to deal with the thickness of the paper. Here it will be readily seen that for a book 7½x5″, the ordinary 12mo., there is a thickness, if it can be discovered, appropriate to its size. The aforesaid examples showed an average thickness of 4.5″, the thinnest being 3.8″, and the thickest 6.6″. This, then, would appear to be an appropriate thickness for the ordinary volume of fiction.

With 3069 books recently examined, 1028 only were under 6/1000″ thick, while 2041 were over that thickness. More modern papers show thicknesses from 2.5/1000″ to 13.25/1000″, with the largest proportion above 6/1000″. Papers under 3.5/1000″ and over 7/1000″ in thickness, and of the qualities under discussion, would be badly bound if sewed in the ordinary fashion.

Out of a total of 3070 books there were 2377 outside these limits. Therefore, because of the unsuitable thickness of their paper for a book 7½x5″—apart from the consideration of their tensile strength—the 2377 books out of 3070 would not be effectively bound if sewed through the folds in the ordinary manner.

With a collection of 700 recent books of fiction, compiled during the last few weeks by the American Library Association as excellent from their literary value, the variations in thickness of their paper were from $^{2.5}/_{1000}$″ to $^{13.25}/_{1000}$″, with a large majority unsuitable in thickness for sewing advantageously in the ordinary manner through the fold.

It may be observed that the papers of the older books, published in 1890 and before, were only recently tested after, in many cases, years of arduous service in which they certainly lost much of their strength, while all the tests of more recent books were naturally of quite new paper.

Below is a rough comparison between the average book printed before 1890 and the paper issued during 1909:

	1890	1909
Tensile strength	10 lbs.	6 lbs.
Loss in the weak way of the grain or fibrous direction	25%	45%
Loss in folding or sewing	20%	50%
Of an undesirable thickness for binding in the ordinary way	5%	77%

The average thickness of paper for fiction before 1890 appears to have varied between $^{3.8}/_{1000}$ to $^{6.6}/_{1000}$″.

Recent publications by the best publishers show, as intimated, a great variation in tensile strength. The following table, figure 13, shows under division of "strongest" and "weakest" those qualities in the papers recently used by 23 different publishers.

Figure 13

The first column under each heading shows the thickness of each paper in thousandths of an inch; the second column its tensile strength flat, and the third column the tensile strength after it has been folded and pierced by the needle.

While it is true that a paper with its fibre running up and down the page is weaker in the fold for sewing, it is fortunately more pliable and falls over more readily in the hand of the reader. So that if a book be carefully over-sewed, instead of being sewed through the folded section, a more pliable book is the result, and, in most cases, a stronger book.

Another source of difficulty in dealing with modern papers is one which arises from the use of calendered and surface papers for illustrations. In their qualities of tensile strength and deterioration under folding and sewing, they have been dealt with among the other papers in the books quoted above. But apart from their qualities in these respects they offer their own special problem. Under the friction of use, when sewed and dealt with in the ordinary manner of bookbinding, the surface of the paper cracks away from its fibrous base and works itself into powder, together with the glue which has been used in lining its back. Losing the support of this gluten, the weakened paper is held entirely, and more loosely, by the sewing and soon the leaves break away.

The varying thicknesses of this class of paper present also their special difficulties for solution. The wise bookbinder would decide to over-sew all the thinner papers of this class, while the thicker papers, if the book be of any value, should be dealt with by means of guarding. Even this more costly method can in some cases be made effective only by sewing as well as stitching on the attached jaconet joint, the surface of the paper offering the same difficulty to holding the guard, though in less degree, that it does in the binding of the book.

	STRONGEST			WEAKEST		
PUBLISHER	THICKNESS	BREAKING STRAIN FLAT	FOLDED AND PIERCED	THICKNESS	BREAKING- STRAIN FLAT	FOLDED & PIERCED
	5	34·75	16·5	3	2·5	1·3
	6	28	10·5	5·5	5·5	2·5
	4·75	22	8·5	6	4·3	2·5
	4·5	31·75	17·5	4	4	1·5
	6	29·	10·75	4	5·25	3
	6·25	18·75	7·3	5·5	4·3	2
	6	23·5	9·75	6·5	7	2
	5·5	40	20	3·5	5	3
	6·5	21	8·3	4·5	4	1·5
	4	19	10·25	4	5	3
	5	20·25	8	3·75	5	2·5
	6	22·5	10	6	5·5	3
	3·5	13	5·75	3	3·5	2
	4·75	13·25	8	4·5	4	1·75
	4·5	14·25	7	4·5	5·5	4
	5·5	10	6·66	6·25	6·5	3
	6·75	17·25	4·5	4·75	5	2·5
	4	17	8	3·5	7	4·25
	4	14·25	7·75	4·5	9·25	5·25
	4·75	9	5·5	3·5	5	2·25
	7·25	10·25	6·5	3·5	6·5	4
	5·75	11·25	8	4·25	3·5	2
	4·75	30	16	4	12	8
	7	14·25	8·5	6·25	6·5	3

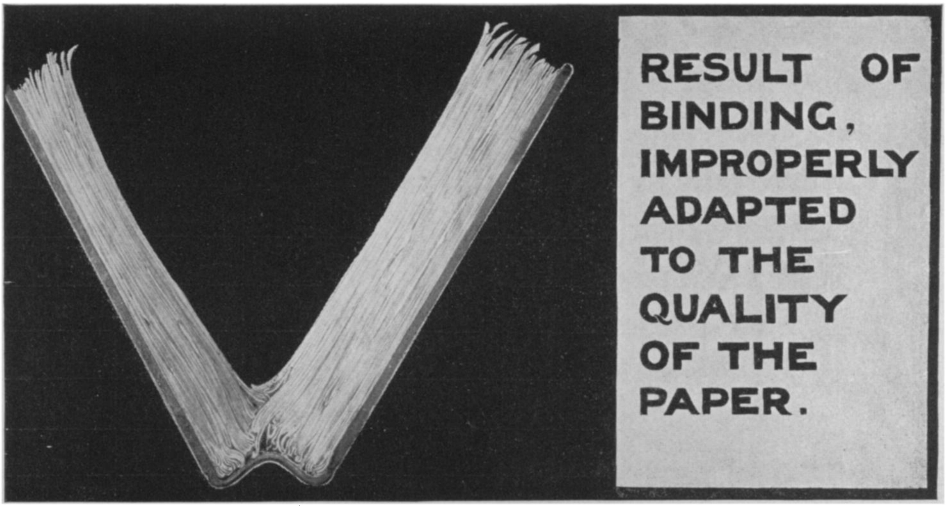

RESULT OF BINDING, IMPROPERLY ADAPTED TO THE QUALITY OF THE PAPER.

FIGURE 14

Figure 14 shows a book of antique feather-weight paper sewed and bound in the ordinary manner, with a tight back. With usage the paper tends to swell in the back with the result shown.

If the nature of its paper were ascertained and it were appropriately bound, a long service might be obtained from this class of book.

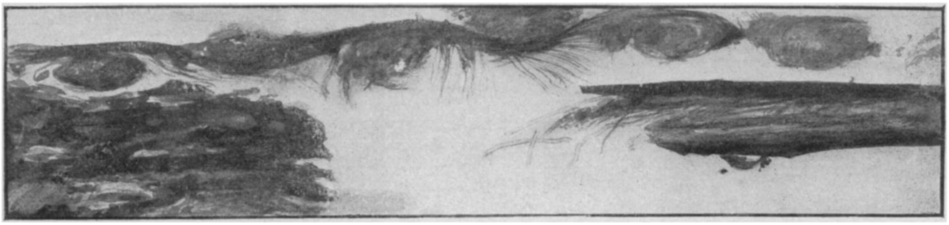
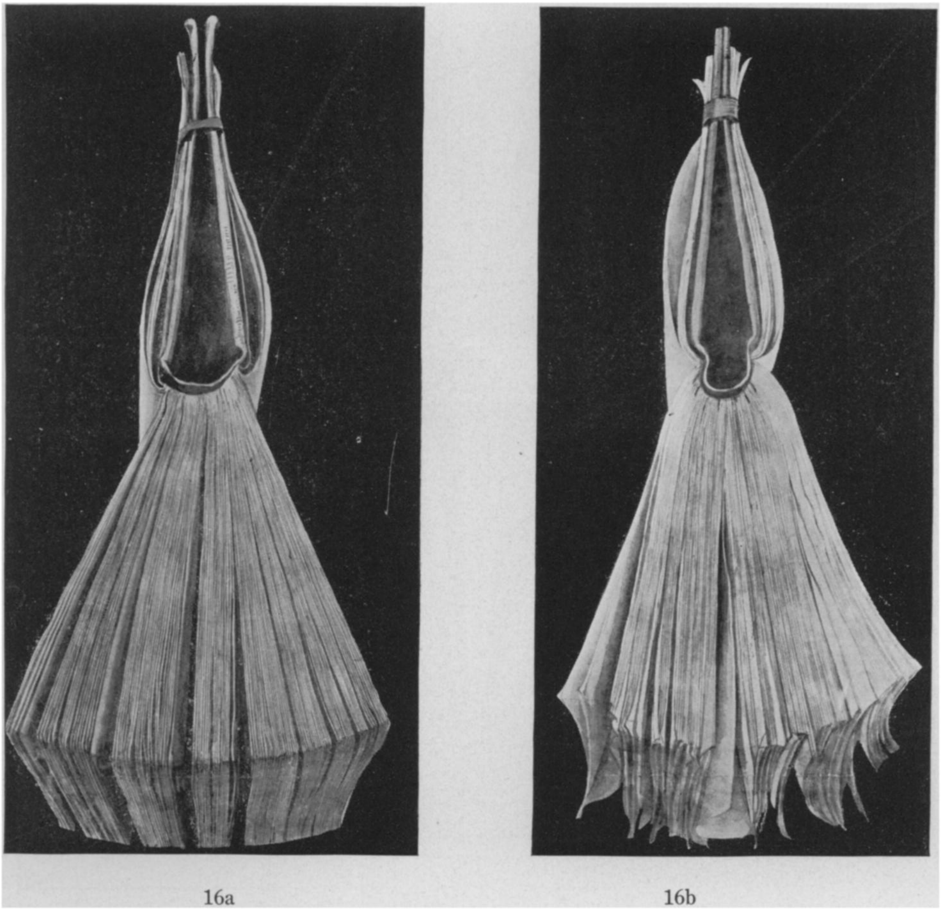


FIGURE 15

Figure 15 is an interesting microphotograph of the edge of a jaconet joint with its cartridge paper guard and a section of this calendered and surface paper under discussion.

The thick spongy nature of the guard and the two black plates of calendered surface with the fibrous mass between are clearly shown, while the cotton material making the joint has become detached in the handling necessary for microscopic mounting. The warp and woof of the jaconet are very apparent.

Fortunately there is very much that can effectively be done to remedy the faults we discover that these poor papers possess over those the bookbinding craft has been trained to deal with. The bookbinder may, if he makes himself cognizant of these data, determine the tensile strength, together with the direction of the grain, and turn these disadvantages into a desirable thing; for much of the paper here described possesses qualities of which he can take advantage. If the paper is made thin it is at least pliable, and while it is impossible to sew it through the fold with profit, it may be carefully over-sewed and may last long enough for the librarian's purpose.



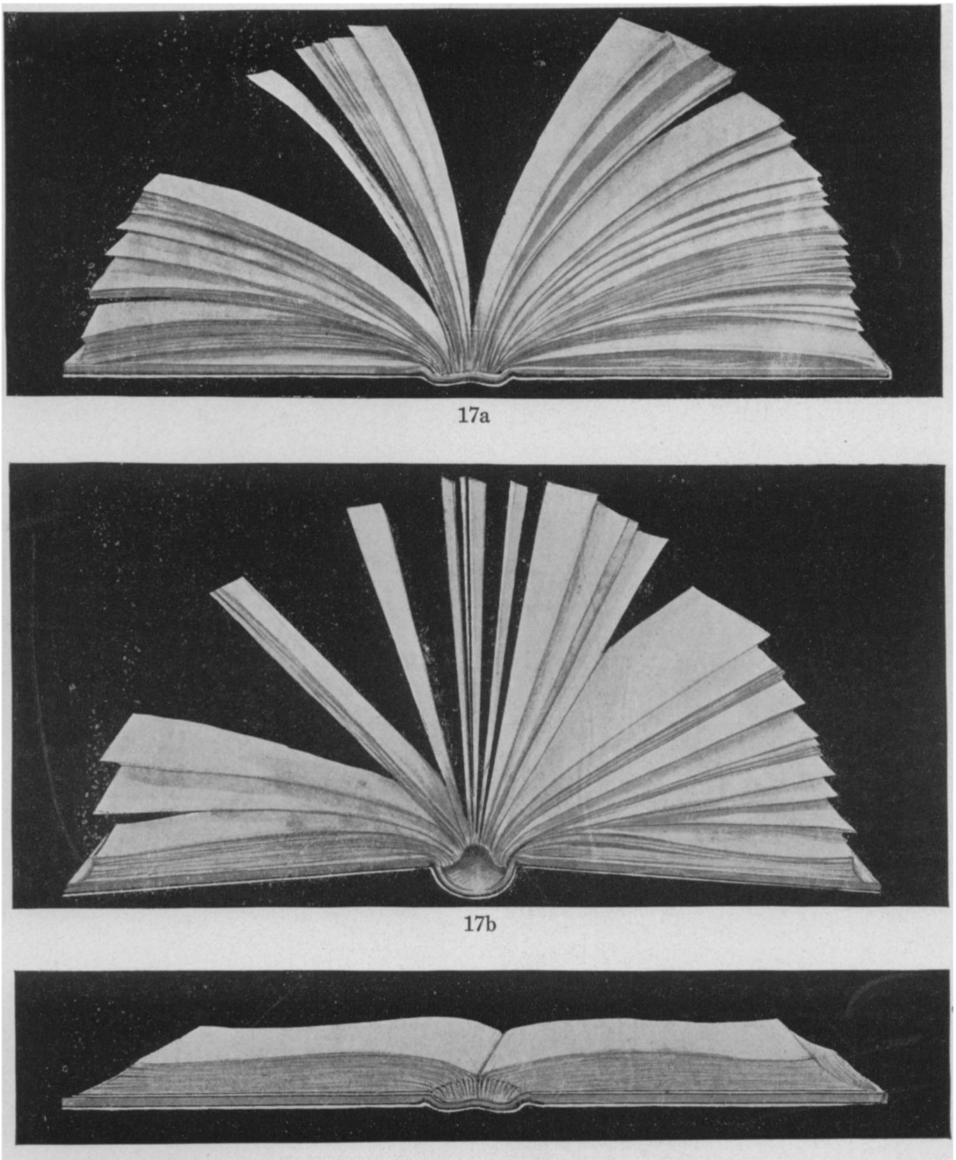
16a 16b

FIGURE 16

Figure 16 is a graphic representation of the necessity of adapting the binding of books to the varying qualities of paper as here discussed. Figure 16a is a book which has been 15 years in service and has been loaned 483 times. Figure 16b is a book bound exactly in the same way and loaned some 10 times only. It would have been possible, if the qualities of the paper had been ascertained, to have bound the book so as to have insured for it as many loans as its paper would have sustained in a cleanly condition.

If, as is very often the case, feather-weight paper is made into a thick sheet, it is impossible either to sew it through, because it is too brittle, or to over-sew it because it is too thick and stiff. But its pulpy nature advantageously admits of making it into a book by means of a linen guard. This method with ordinary paper would make an ugly, thick book, but the soft, yielding nature of this paper under pressure makes way for the linen, and the result is a comparatively serviceable and good looking book. (See figure 17c.)

With both these kinds of bad paper economical service can then be obtained.



17a

17b

17c

FIGURE 17

Figures 17a and b are exact facsimile drawings from photographs of books composed of this thick calendered paper. The method of sewing with either a tight or a loose back, as shown, is futile, while the plan seen in figure c makes a perfectly bound book.

THE SECRETARY: You bind most of your books in sheets that come from the publishers. Are you able to tell whether you can get better papers from these publishers if you return those of the quality you cite here as troubling you? In other words, if the publisher furnishes you this very bad paper, can you, by returning it and saying it is unbindable, get a better paper?

MR CHIVERS: I think librarians can not expect publishers to give them better paper when they consider that 90% or more of their clients are satisfied with the paper supplied. I feel quite sure, however, that the publishers are in the dark about the mechanical qualities of such a paper as I have been discussing, and I think objections have been made about publishers' bindings which have not at all times been altogether reasonable. Perhaps dealing with the matter as I suggest may have no immediate effect, but I think it will have a tendency to bring about gradually a better state of affairs. I would hold myself ready to send the results of the mechanical tests I have made, if I found it incumbent upon me to return any books discovered to be unsuitable for strong binding because of the worthlessness of their papers.

THE PRESIDENT: You know, ladies and gentlemen, that juvenile artists sometimes label the product of their brush or pencil, "This is the picture of a man," "This is a tree," "This is a picture of a fox catching a goose. You can't see the fox, because he is behind the hay-stack." Similarly, I might characterize and label the general sessions of this conference, in the final act of which we are now engaged. After the opening session, our first general session dealt with questions which were primarily of interest to librarians. The next broadened a little and included questions of interest to educators, as well. This last session is of still wider scope, and when the Program committee got through arranging for it, I think they felt a good deal as Terence must have felt when he wrote the famous words, "I am a man. I consider nothing that is human foreign to me." And, since this session has such broad scope, we deem ourselves singularly fortunate that we have been able to assign the place of honor in the program to a gentleman who is perhaps as human, as humane and as genial as any of the distinguished authors or speakers in this country. It would be little less than presumption on my part if I were to attempt to introduce to the "gentle readers" before me the reverend Dr S. M. Crothers. You all know his works and delight in them. Many of you have his personal acquaintance, and I shall not further intervene between you and the treat that he has in store for you. I beg Dr Crothers to be so kind as to address you.

Dr Crothers's address entitled,

A FAIRY STORY FOR LIBRARIANS

will be published in the "Atlantic Monthly" for December 1909, under the title, "The convention of books."

THE PRESIDENT: I am sure we would all like an encore.

Ladies and gentlemen, there is simply nothing to be said after such a delightful paper as we have heard except to express unbounded thanks to Dr Crothers for the very great pleasure that he has given us. You will appreciate the weight of the obligation we are under to him for coming here, when I tell you that he will be obliged to sit up nearly all night as a return for giving us this delight. We thank him most heartily for the paper that he has read us and for subjecting himself to much inconvenience on our behalf.

We are to have a variety of interests before us today. The next paper will come into fine contrast with the one that we have just heard.

Will MR E. F. STEVENS, of Pratt Institute read us his paper on

THE CRITERIA FOR SELECTION OF TECHNICAL LITERATURE

Technical books, and the very idea of them, are foreign to a region of summer hotels and mountain scenery. There is nothing in this landscape that suggests the literature of machines. Yet at a library convention, however serene the environment, it still remains proper to mention